Rocky Flats Environmental Technology Site

PRE-DEMOLITION SURVEY REPORT (PDSR)

BUILDING 428 CLOSURE PROJECT

REVISION 0

January 22, 2003

CLASSIFICATION REVIEW NOT REQUIRED PER EXEMPTION NUMBER CEX-005-02

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PRE-DEMOLITION SURVEY REPORT (PDSR)

BUILDING 428 CLOSURE PROJECT

REVISION 0

January 22, 2003

Reviewed by: _____ Date: 1/21/03
Don Risoli, Quality Assurance

Reviewed by: _____ Date: 1/21/03
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ATTACHMENTS

ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 428. Because this Type 1 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Group 13 Reconnaissance Level Characterization Report of this Type 1 facility. Building surfaces characterized as part of this PDS included the floors, walls, ceilings, and roof. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

This PDS encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Group 13 Historical Site Assessment Report, dated November, 2001, Revision 0, and the Group 13 Reconnaissance Level Characterization Report dated April 3, 2002, Revision 0. Results indicate that no radiological, beryllium, or chemical contamination exists in excess of the PDSP unrestricted release limits. Asbestos containing materials were identified in the Building 428 black tar-impregnated roofing materials. Potentially PCB-containing fluorescent light ballast and any hazardous-waste items (e.g., mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury-containing gauges, circuit boards, leaded glass, and lead-acid batteries) were previously removed from the building.

Asbestos containing materials will be managed and disposed of in compliance with Colorado Department of Public Health and Environment (CDPHE) regulations and site requirements. Demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal,* as applicable. Concrete associated with these facilities meet the criteria for recycling concrete per the RFCA RSOP for Recycling Concrete.

To ensure that the facility remains free of contamination and that PDS data remain valid, isolation controls have been established, and the area has been posted accordingly.

1 INTRODUCTION

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 428. Because this Type 1 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Group 13 Reconnaissance Level Characterization of this Type 1 facility. Building surfaces characterized as a part of this PDS included the floor, walls, ceiling and roof. Environmental media beneath and surrounding the facility was not within the scope of this PDS and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these are Building 428. The location of this facility is shown in Attachment A, Facility Location Map. This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before this Type 1 facility can be demolished, the Reconnaissance Level Characterization Report (RLCR) must meet Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS); this document presents the PDS results for Building 428. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific Group 13 Historical Site Assessment Report, dated November, 2001, and the Group 13 Reconnaissance Level Characterization Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of the Building 428 PDS effort. PDSs are performed before building demolition to define the final radiological and chemical conditions of a facility. Final conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the final radiological and chemical conditions of Building 428. Environmental media beneath and surrounding the facilities are not within the scope of this PDSR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this PDS were the same DQOs identified in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

A Facility-specific Historical Site Assessment (HSA), dated November 2001, Revision 0, and a Reconnaissance Level Characterization (RLC) was conducted to understand the facility history and related hazards. The HSA consisted of facility walkdowns, interviews, and document review, including review of the Historical Release Report, and were used to design the RLC. The Building 428 RLC was performed in FY 2002 as part of the Area 1, Group 13 RLCR (*Reconnaissance Level Characterization Report for Area 1, Group 13 Facilities*, dated April 3, 2002, Rev. 0). Based on the RLC results, B428 was classified as a Type 1 facility, and required a PDS characterization be performed prior to demolition of the facility, this report documents the results of that PDS. The HSA and RLC results were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. Group 13 HSA and RLC documentation is located in the RISS Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Building 428 was characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files for the Building 428 Radiological Characterization Plan). One radiological survey unit package was developed for the B428 interior (428-A-001) as part of this PDSR. Survey unit package G13-B-003 was developed for the B428 exterior and was surveyed per PDS requirements as part of the Group 13 RLCR dated April 3, 2002, Revision 0. Individual radiological survey unit packages are maintained in the RISS Characterization Project files.

Building 428 survey unit packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachment B, Radiological Data Summary and Survey Maps.

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B428 Interior (Survey Unit 428-A-001)
Prior to the PDS, the building was stripped of equipment. The interior was classified as a MARSSIM Class 2 Survey Unit. A total of 23 TSA measurements (15 systematically grid, 5 biased and 3 QC), 20 RSA measurements (15 systematically grid and 5 biased), 15 media samples were taken, and scan surveys were performed. Alpha scan surveys of 100% of interior floor and walls below 2 meters (111 m^2 minimum) and 25% of the upper wall (>2 meters) and ceiling surfaces (48 m^2 minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. All results were below unrestricted release limits. Radiological survey data, statistical analysis results, and survey locations are presented in Attachment B-1, Radiological Data Summary and Survey Maps.

B428 Exterior (Survey Unit G13-B-003)
The B428 exterior was classified as a MARSSIM Class 3 Survey Unit. A total of 17 TSA measurements (15 random, 2 QC) and 15 RSA measurements (15 random) were taken, and a 5% minimum scan survey was performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. All results were below unrestricted release limits. Refer to Attachment B-2 for survey data, statistical analysis results, survey locations, and radiological scan maps.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Building 428 was characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on or in Building 428. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan was developed during the planning phase that describes sampling requirements and the justification for the sample locations and estimated sample numbers. Contaminants of concern included asbestos, beryllium, and RCRA/CERCLA constituents. Refer to Attachment C, Chemical Summary Data and Sample Maps, for details on sample results and sample locations. Isolation control postings are displayed on affected structures to ensure no hazardous materials are introduced.

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted in Building 428 as part of this PDS. A CDPHE-certified asbestos inspector conducted the inspections and sampling was performed in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1.* Building materials suspected of containing asbestos were identified for sampling at the discretion of the inspector.

After visual and tactile inspections of Building 428, only the black tar-impregnated roofing materials were positive for asbestos [> 1% by volume]. PDS asbestos laboratory sample data and location maps are contained in Attachment C, "Chemical Data Summaries and Sample Maps."

4.2 Beryllium (Be)

Since Building 428 had a history of storing and pumping process waste water that contained potentially contaminated beryllium liquids, random and biased beryllium sampling was performed in accordance with the PDSP and the *Beryllium Characterization Procedure, PRO-536-BCPR, Revision 0,September 9, 1999.* Random sample points were computer generated, while biased sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition. All beryllium sample results were less than the investigative limit of 0.1 $\mu g/100cm^2$. The smear samples were collected in accordance with the PDSP and the *Beryllium Characterization Procedure,* PRO-536-BCPR, Revision 0, September 9, 1999. PDS beryllium laboratory sample data and location maps are contained in Attachment C, "Chemical Data Summaries and Sample Maps."

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on the HSAR for Group 13 facilities, interviews, facility walkdowns and a review of historical WSRIC processes, Building 428 contained Tank D-853 (RCRA Unit 40). Tank D-853 was used to receive waste from Buildings 122 and 123. Building 428 also contained waste transfer lines associated with B444/447. Small volume spills involving waste from Tank D-853 and the transfer lines are known to have occurred. Environmental core samples of the slab were taken to determine if these historical processes had led to contamination of the slab. The environmental core sample results did not indicate the presence of RCRA/CERCLA constituents, and therefore, the slabs are not considered hazardous waste. All core sample results were below regulatory limits for each constituent and are reported in Attachment C, Chemical Data Summaries and Sample Maps, of this PDSR. Additionally, after removal of the storage tank (RCRA Unit 40), the floor was rinsed and the rinse water collected and sampled to ensure that tank removal procedures did not contaminate the slab. The rinse/sample process was repeated until all samples passed the RFCA Tier II Groundwater Action Levels. The rinse water data can be found in the Building 428 RISS Characterization Project Files.

The building may have contained some RCRA regulated items, such as mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, and lead-acid batteries. These items have been removed and managed in accordance with the Colorado Hazardous Waste Act.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSAR for Group 13 facilities, interviews, facility walkdowns and a review of historical WSRIC processes, only trace amounts of PCBs may have passed through the B444/447 waste transfer lines, which run through Building 428. These trace amounts would not have led to PCB contamination above the PCB unrestricted release levels of the building structure/slab, therefore, sampling for PCBs was not conducted as part of this PDS.

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Based on the age of 428, paints used on the facility may contain PCBs; and therefore, painted surfaces will be managed as PCB Bulk Product Waste. Painted concrete surfaces can be used as backfill on site in accordance with approval received from EPA in November 2001 (letter from K. Clough, US EPA Region 8, to J. Legare, DOE RFFO, 8EPR-F, Approval of the Risk-Based Approach for Polychlorinated Biphenyls (PCB)-Based Painted Concrete), provided the concrete meets the unrestricted-release criteria outlined in the Concrete Recycling RSOP.

The facility may have contained PCB fluorescent light ballast, however, all PCB ballast has been removed from the facility.

5 PHYSICAL HAZARDS

Physical hazards associated with Building 428 consists of those common to standard industrial environments, and include hazards associated with energized systems, utilities, and trips and falls. The majority of the building resides below the surround ground level and therefore may present demolition equipment challenges during demolition. The facility has been relatively well maintained and is in good physical condition, and therefore, does not present hazards associated with building deterioration. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Building 428, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B and C) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- the *number* of samples and surveys;
- the *types* of samples and surveys;
- the sampling/survey process as implemented "in the field"; and
- the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment D.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of Building 428 will generate a variety of wastes. Estimated waste types and waste volumes are presented below. All wastes can be disposed of as sanitary waste, except asbestos and PCB Bulk Product Waste. Asbestos containing materials will be managed and disposed of in compliance with Colorado Department of Public Health and Environment (CDPHE) regulations and site requirements. PCB ballast and hazardous waste items have been removed and managed pursuant to Site PCB and waste management procedures. All concrete surfaces can be used as backfill onsite in accordance with the RFCA RSOP for Recycling Concrete.

WASTE TYPES AND VOLUME ESTIMATES

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
428	1200	0	100	0	0	38	None

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Building 428 is classified as an RFCA Type 1 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). Building 428 possesses no radiological, beryllium, or chemical contamination in excess of the PDSP unrestricted release limits. PCB ballast and hazardous-waste items have been removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. Asbestos containing materials will be managed and disposed of in compliance with Colorado Department of Public Health and Environment (CDPHE) regulations and site requirements.

The B428 PDS was performed in accordance with the PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. To ensure that Building 428 remains free of contamination and that PDS data remain valid, isolation controls have been established, and the facilities are posted accordingly.

9 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. Rocky Flats Cleanup Agreement (RFCA), July 19, 1996.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment."

DOE Order 414.1A, "Quality Assurance."

EPA, 1994. "The Data Quality Objective Process," EPA QA/G-4.

K-H, 1999. Decommissioning Program Plan, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, Asbestos Characterization Procedure, Revision 0, August 24, 1999.

PRO-536-BCPR, Beryllium Characterization Procedure, Revision 0, August 24, 1999.

RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.

RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

RFETS, RFCA RSOP for Recycling Concrete, September 28, 1999

RFETS Reconnaissance Level Characterization Report for Group 13 Closure Project, dated April 3, 2002.

RFETS, Historical Site Assessment for Building 428, dated November, 2001, Revision 0.

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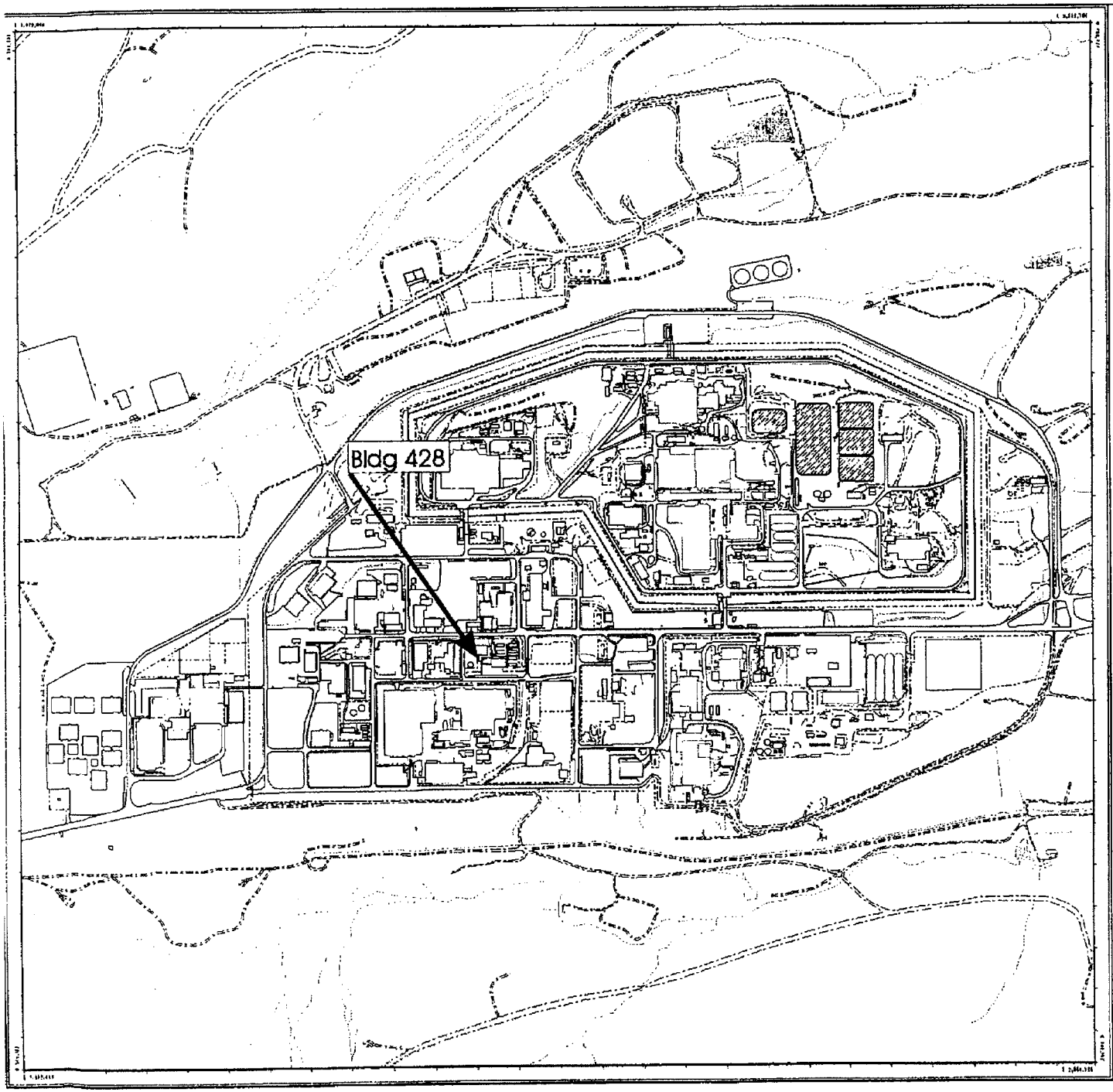
ATTACHMENT A

Facility Location Map



Group 13
Building 428

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEPs)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale – 1 : 1240
1 inch represents approximately 1038 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:
DynCorp
THE ART OF TECHNOLOGY

Prepared for:
KH
KAISER-HILL COMPANY

MAP ID: FY 2002

January 14, 2003

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ATTACHMENT B

Radiological Data Summaries and Survey Maps

SURVEY UNIT B428-A-001
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B428 (Interior)

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B428-A-001
PDS Data Summary

Total Surface Activity Measurements

	15 Number Required	20 Number Obtained	
MIN	-6.5		dpm/100 cm^2
MAX	23.9		dpm/100 cm^2
MEAN	9.0		dpm/100 cm^2
STD DEV	9.7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15 Number Required	20 Number Obtained	
MIN	-0.9		dpm/100 cm^2
MAX	1.5		dpm/100 cm^2
MEAN	-0.1		dpm/100 cm^2
STD DEV	0.7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

Media (Pre & Post) Total Surface Activity Measurements

	30 Number Required	30 Number Obtained	
MIN	-10.4		dpm/100 cm^2
MAX	27.2		dpm/100 cm^2
MEAN	7.6		dpm/100 cm^2
STD DEV	9.4		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Media (Pre & Post) Removable Activity Measurements

	30 Number Required	30 Number Obtained	
MIN	0.0		dpm/100 cm^2
MAX	4.5		dpm/100 cm^2
MEAN	1.4		dpm/100 cm^2
STD DEV	2.1		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

Media Samples

	15 Number Required	15 Number Obtained	
		Transuranic	
MIN	0.0		dpm/100 cm^2
MAX	43.5		dpm/100 cm^2
MEAN	17.3		dpm/100 cm^2
STD DEV	19.7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

		Uranium	
MIN	1010.4		dpm/100 cm^2
MAX	2614.5		dpm/100 cm^2
MEAN	1769.5		dpm/100 cm^2
STD DEV	517.1		dpm/100 cm^2
URANIUM DCGL$_W$	5,000		dpm/100 cm^2

SURVEY UNIT B428-A-001
TSA - DATA SUMMARY

Manufacturer:	N.E Tech	N.E Tech	N.E Tech	N.E Tech	N.E Tech
Model:	DP-6	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	3	4	5
Serial #:	767	1445	1425	1379	3125
Cal Due Date:	6/26/03	6/30/03	6/13/03	6/3/03	4/21/03
Analysis Date:	1/13/03	1/13/03	1/13/03	1/13/03	1/13/03
Alpha Eff. (c/d):	0.219	0.224	0.210	0.229	0.216
Alpha Bkgd (cpm)	4.0	2.0	3.3	3.3	0.7
Sample Time (min)	2	2	2	2	2
LAB Time (min)	10	10	10	10	10
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1,2]
1	2	5.3	23.7	1.3	5.8	5.1
2	2	6.7	29.9	4.0	17.9	11.4
3	2	9.3	41.5	6.0	26.8	23.0
4	1	4.0	18.3	1.3	5.9	-0.3
5	2	6.0	26.8	3.3	14.7	8.3
6	1	7.3	33.3	7.3	33.3	14.8
7	2	8.0	35.7	5.3	23.7	17.2
8	2	2.7	12.1	1.3	5.8	-6.5
9	2	4.7	21.0	4.0	17.9	2.5
10	1	9.3	42.5	4.7	21.5	23.9
11	2	5.3	23.7	3.3	14.7	5.1
12	2	2.7	12.1	4.0	17.9	-6.5
13	1	6.7	30.6	6.0	27.4	12.1
14	1	8.0	36.5	6.7	30.6	18.0
15	2	4.0	17.9	3.3	14.7	-0.7
16	2	8.0	35.7	4.0	17.9	17.2
17	2	3.3	14.7	2.7	12.1	-3.8
18	1	7.3	33.3	4.7	21.5	14.8
19	2	2.0	8.9	2.7	12.1	-9.6
20	2	7.3	32.6	0.7	3.1	14.1
					18.5	Sample LAB Average
					MIN	-9.6
					MAX	23.9
					MEAN	8.0
					SD	10.2
					Transuranic DCGL$_W$	100

1 - Average LAB used to subtract from Gross Sample Activity

QC Measurements

2 QC	1	6	27.4	4	18.3	10.7
11 QC	1	6.7	30.6	3.3	15.1	13.9
					16.7	QC LAB Average
					MIN	10.7
					MAX	13.9
					MEAN	12.3
					Transuranic DCGL$_W$	100

1 - Average QC LAB used to subtract from Gross Sample Activity

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SURVEY UNIT B428-A-001
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	6	7	8	9
Serial #:	767	1164	833	966
Cal Due Date:	5/13/03	6/17/03	2/28/03	5/7/03
Analysis Date:	1/13/03	1/13/03	1/13/03	1/13/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.3	0.1	0.3	0.0
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	6	1.0	0.6
2	7	0.0	-0.3
3	8	0.0	-0.9
4	9	0.0	0.0
5	6	1.0	0.6
6	7	0.0	-0.3
7	8	0.0	-0.9
8	9	1.0	1.5
9	7	0.0	-0.3
10	6	0.0	-0.9
11	8	0.0	-0.9
12	9	0.0	0.0
13	6	1.0	0.6
14	7	0.0	-0.3
15	8	1.0	0.6
16	9	0.0	0.0
17	6	1.0	0.6
18	7	2.0	2.7
19	8	0.0	-0.9
20	9	0.0	0.0
		MIN	-0.9
		MAX	1.5
		MEAN	-0.1
		SD	0.7
		Transuranic DCGL$_W$	**20**

B428-A-001
Media TSA Data Summary

Manufacturer:	N.E.Tech	N.E.Tech	N.E.Tech
Model:	Electra	Electra	Electra
Instrument ID#:	1	2	3
Serial #:	396	1250	2343
Cal Due Date:	1/12/03	10/10/02	10/2/02
Analysis Date:	8/21/02	8/21/02	8/21/02
Alpha Bkgd (cpm)	5.0	0.0	1.5
Alpha Eff. (C/d)	0.234	0.213	0.223
Instrument α MDC ($dpm/100cm^2$)	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1, 2]
Pre 1	3	0.7	3.1	2.0	9.0	-7.2
Pre 2	1	2.7	11.5	5.3	22.6	1.2
Pre 3	2	1.3	6.1	1.3	6.1	-4.2
Pre 4	1	6.7	28.6	4.7	20.1	18.3
Pre 5	2	3.3	15.5	4.7	22.1	5.1
Pre 6	2	4.0	18.8	2.7	12.7	8.4
Pre 7	2	4.7	22.1	1.3	6.1	11.7
Pre 8	2	4.0	18.8	1.3	6.1	8.4
Pre 9	2	7.3	34.3	2.7	12.7	23.9
Pre 10	3	6.0	26.9	3.3	14.8	16.6
Pre 11	2	3.3	15.5	2.0	9.4	5.1
Pre 12	2	2.0	9.4	2.0	9.4	-1.0
Pre 13	2	4.0	18.8	2.0	9.4	8.4
Pre 14	2	2.7	12.7	0.7	3.3	2.3
Pre 15	3	2.7	12.1	3.3	14.8	1.8
Post 1	2	3.3	15.5	1.3	6.1	5.1
Post 2	2	4.0	18.8	4.0	18.8	8.4
Post 3	2	2.7	12.7	1.3	6.1	2.3
Post 4	2	3.3	15.5	2.7	12.7	5.1
Post 5	2	4.0	18.8	2.7	12.7	8.4
Post 6	2	1.3	6.1	2.0	9.4	-4.2
Post 7	3	0.0	0.0	0.0	0.0	-10.4
Post 8	3	2.7	12.1	2.0	9.0	1.8
Post 9	3	3.3	14.8	0.7	3.1	4.4
Post 10	3	7.3	32.7	1.3	5.8	22.4
Post 11	3	6.0	26.9	3.3	14.8	16.6
Post 12	3	4.1	18.4	1.3	5.8	8.0
Post 13	2	8.0	37.6	0.7	3.3	27.2
Post 14	2	7.3	34.3	3.3	15.5	23.9
Post 15	3	4.7	21.1	2.0	9.0	10.7

1 - Average LAB used to subtract from Gross Sample Activity

10.4	**Sample LAB Average**
MIN	-10.4
MAX	27.2
MEAN	7.6
SD	9.4
Transuranic $DCGL_w$	100

QC Measurements

Pre 4 QC	2	3	14.1	2	9.4	2.0
Post 4 QC	3	2	9.0	3.3	14.8	-3.1

1 - Average QC LAB used to subtract from Gross Sample Activity

12.3	**QC LAB Average**
MIN	-3.1
MAX	2.0
MEAN	-0.6
Transuranic $DCGL_w$	100

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B428-A-001
Media RSC Data Summary

Manufacturer:	Eberline	Eberline
Model:	Sac-4	Sac-4
Instrument ID#:	4	5
Serial #:	1048	821
Cal Due Date:	8/28/02	12/9/02
Analysis Date:	8/22/02	8/22/02
Alpha Eff. (c/d):	0.0	0.1
Alpha Bkgd (cpm)	33.0%	33.0%
Sample Time (min)	9.0	9.0
Bkgd Time (min)	N/A	N/A
MDC (dpm/100cm^2)	N/A	N/A

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
Pre 1	4	3	4.5
Pre 2	5	0	-0.3
Pre 3	4	3	4.5
Pre 4	5	0	-0.3
Pre 5	4	3	4.5
Pre 6	5	0	-0.3
Pre 7	4	3	4.5
Pre 8	5	0	-0.3
Pre 9	4	3	4.5
Pre 10	5	0	-0.3
Pre 11	4	3	4.5
Pre 12	5	0	-0.3
Pre 13	4	3	4.5
Pre 14	5	0	-0.3
Pre 15	4	0	0.0
Post 1	4	0	0.0
Post 2	5	0	-0.3
Post 3	4	0	0.0
Post 4	5	0	-0.3
Post 5	4	0	0.0
Post 6	5	3	4.2
Post 7	4	0	0.0
Post 8	5	0	-0.3
Post 9	4	3	4.5
Post 10	5	0	-0.3
Post 11	4	0	0.0
Post 12	5	0	-0.3
Post 13	4	0	0.0
Post 14	5	0	-0.3
Post 15	4	0	0.0
		MIN	-0.3
		MAX	4.5
		MEAN	1.2
		SD	2.2
		Transuranic DCGL$_W$	**20**

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B428-A-001
Media Conversion

LOCATION DESCRIPTION	SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (m²)	INDIVIDUAL NUCLIDE (dpm/100cm²) (3)	ESTIMATED MDA (dpm/100cm²) (4)	URANIUM TOTAL (dpm/100cm²)	TRANSURANIC TOTAL (dpm/100cm²)
B428 Floor	2,9,13	02S0220-016.001	U-234	1.660	9.750	147.0	24.5	343	2013		
			U-235	0.114	0.024			24	5		
			U-238	3.120	0.145			644	30	1010.4	
			Pu-239 Pu-240	0.000	0.210			0	43		
			Am-241	0.000	0.026			0	5		0.0
B428 Floor	4,15	02S0220-017.001	U-234	8.250	6.130	138.0	24.5	1599	1188		
			U-235	0.113	0.029			22	6		
			U-238	1.510	0.149			293	29	1913.6	
			Pu-239 Pu-240	0.156	0.186			30	36		
			Am-241	0.019	0.023			4	4		33.9
B428 Floor	7,10,12	02S0220-018.001	U-234	7.020	6.510	142.0	24.5	1400	1298		
			U-235	0.101	0.044			20	9		
			U-238	1.620	0.146			323	29	1743.3	
			Pu-239 Pu-240	0.000	0.207			0	41		
			Am-241	0.000	0.025			0	5		0.0
B428 Floor	1,11,14	02S0220-019.001	U-234	12.000	6.870	138.0	24.5	2326	1332		
			U-235	0.099	0.038			19	7		
			U-238	1.390	0.146			269	28	2614.5	
			Pu-239 Pu-240	0.122	0.191			24	37		
			Am-241	0.015	0.023			3	5		26.6
B428 Floor	3,8	02S0220-020.001	U-234	6.040	5.960	129.0	24.5	1094	1080		
			U-235	0.109	0.031			20	6		
			U-238	2.790	0.156			505	28	1619.6	
			Pu-239 Pu-240	0.214	0.185			39	33		
			Am-241	0.026	0.023			5	4		43.5
B428 Floor	5,6	02S0220-021.001	U-234	7.400	6.120	144.0	24.5	1497	1238		
			U-235	0.063	0.026			13	5		
			U-238	1.020	0.138			206	28	1715.7	
			Pu-239 Pu-240	0.000	0.195			0	39		
			Am-241	0.000	0.024			0	5		0.0
									MIN	1010.4	0.0
									MAX	2614.5	43.5
									MEAN	1769.5	17.3
									SD	517.1	19.7
									$DCGL_W$ =	5000	100

(1) The paint samples were analyzed as grouped composites using the Canberra ISOCS Gamma Spectroscopy system.

(2) Critical Level test criterion were utilized in this analysis. If the net peak area was less than the L_c (critcal level), then a "not detected" or "zero" decision was made. The LC value is always less than the applicable MDA, but greater than zero.

(3) The samples were composited. The individual nuclide dpm/100 cm^2 conversion is conservatively based on the composite sample weight. This assumption presumes that the total sample activity from composited samples is located at one, single sample location. This methodology ensures that no single sample location exceeds the applicable DCGLW.

(4) The samples were composited. The estimated MDA dpm/100 cm^2 conversion is conservatively based on the composite sample weight.

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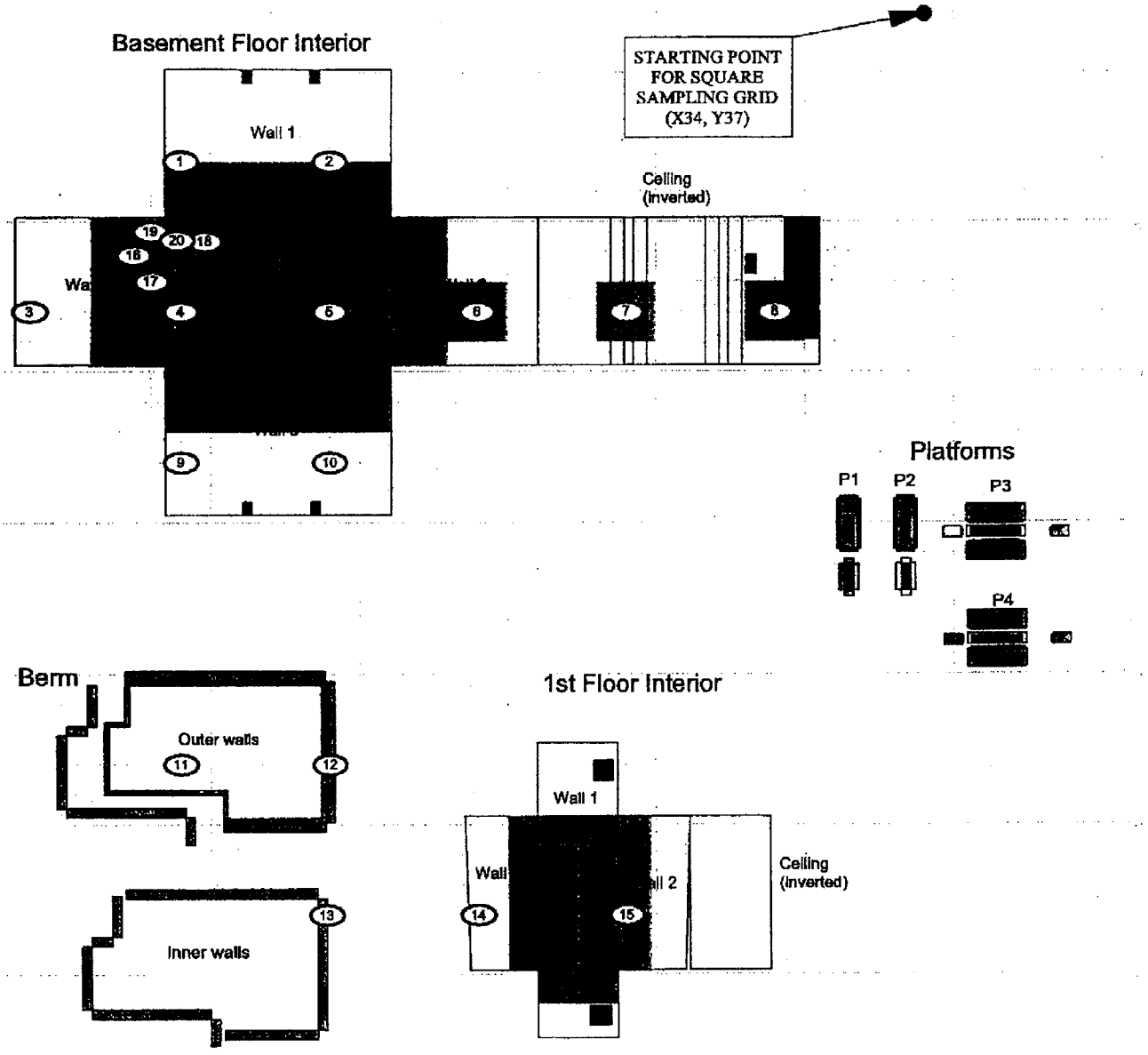
PRE-DEMOLITION SURVEY FOR BUILDING 428

Survey Area: A **Survey Unit: B428-A-001** **Classification: 2**
Building: 428
Survey Unit Description: Interior of Building
Total Area: 310 sq. m. **Total Floor Area: 40 sq. m.**

Building 428 Interior



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
3, 4 & 5

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp
THE ART OF TECHNOLOGY

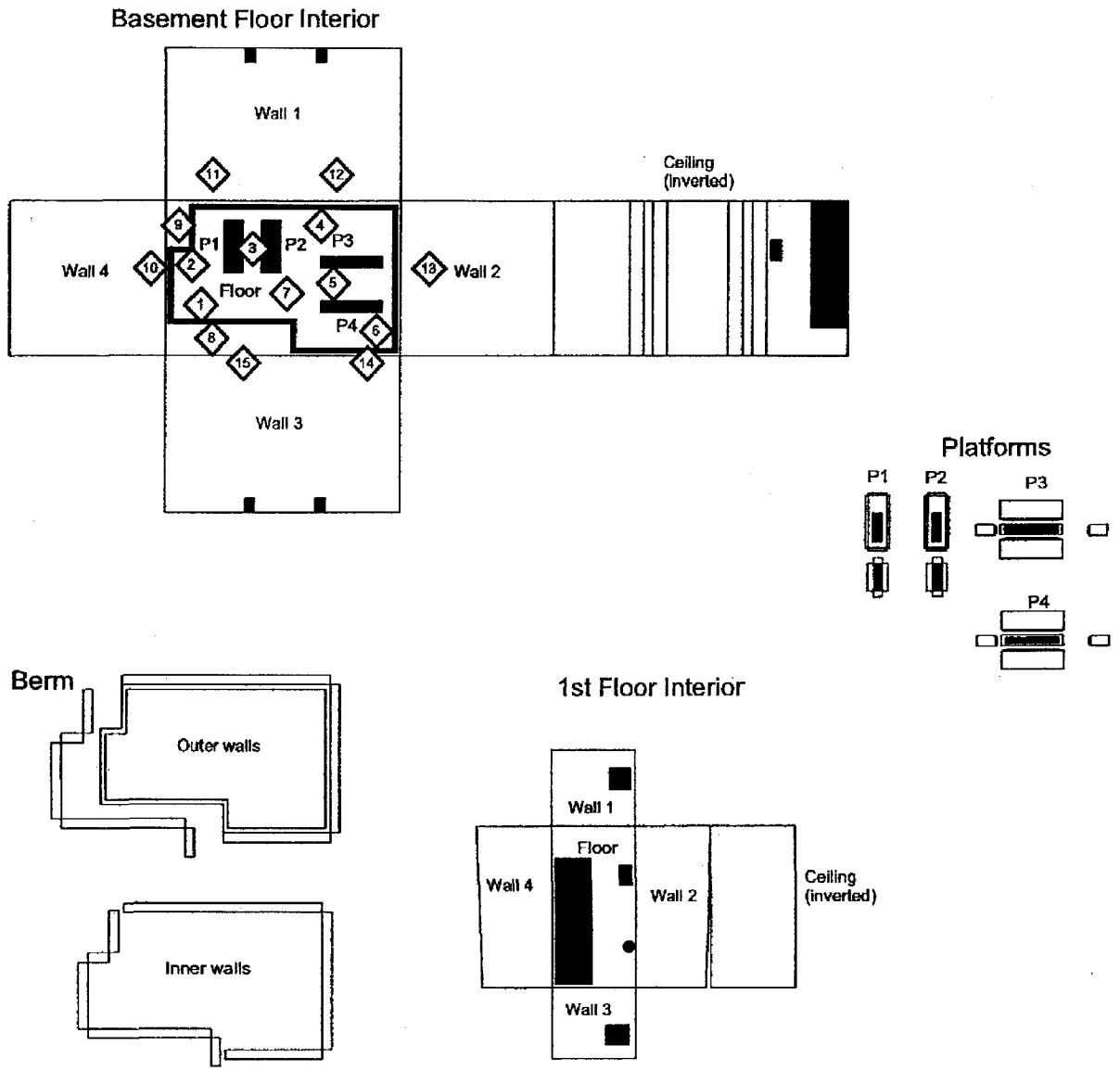
KAISER HILL

MAP ID: 02-0155/428-IN-SC January 16, 2003

PRE-DEMOLITION SURVEY FOR BUILDING 428

Survey Area: A **Survey Unit: B428-A-001** **Classification: 2**
Building: 428
Survey Unit Description: Interior of Building
Total Area: 310 sq. m. **Total Floor Area: 40 sq. m.**

Building 428
Media Sample Map



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:

DynCorp
THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0155/428-Media

August 11, 2002

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CANBERRA

Analysis Results Header 11/5/2002 9:36:50 AM Page 1

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**********************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S      *****
**  C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
```

Report Generated On : 11/5/2002 9:36:50 AM

RIN Number : 02S0220
Analytical Batch ID : 0208234732
Line Item Code : RC10B019

B428

B428-A-001

Media Sample Locations

2, 9, 13

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Sample Number : 02S0220-016.001
Lab Sample Number : CMLS-1635
Sample Receipt Date : 8/23/2002
Sample Volume Received : 1.47E+002 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.470E+002 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/21/2002 9:35:00 AM
Acquisition Started : 8/23/2002 1:54:41 PM

Count Time : 86400.0 seconds
Real Time : 86467.3 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/1/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/26/02
Efficiency Geometry ID : 02S0220-016.001

Analyzed By: Sheri Chambers Date: 11/5/02

Reviewed By: Marilyn Umbaugh Date: 11/5/02

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CANBERRA

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0220-016.001

Analytical Batch ID : 0208234732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1635

Geometry ID : 02S0220-016.001

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	9.78E+000	4.66E-001	5.08E-001
CS-137	0.00E+000	0.00E+000	3.92E-002
TL-208	1.52E-001	2.33E-002	3.67E-002
PO-210	1.52E+003	6.95E+002	1.78E+003
BI-212	5.26E-001	2.80E-001	4.58E-001
PB-212	3.87E-001	1.94E-002	2.72E-002
BI-214	2.49E-001	4.59E-002	7.61E-002
PB-214	2.06E-001	1.82E-002	3.77E-002
RA-226	1.01E+000	5.10E-001	3.95E-001
AC-228	4.55E-001	6.55E-002	1.22E-001
TH-230	0.00E+000	0.00E+000	2.40E+000
Th-231	2.57E-001	4.54E-002	1.18E-001
PA-234	0.00E+000	0.00E+000	3.57E-002
PA-234M	4.98E+000	2.94E+000	3.86E+000
U-234	1.66E+001	5.94E+000	9.75E+000
U-235	1.14E-001	2.69E-002	2.44E-002
U238	3.12E+000	1.86E-001	1.45E-001
AM-241	0.00E+000	0.00E+000	2.56E-002

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CANBERRA

Analysis Results Header 11/5/2002 9:41:14 AM Page 1

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*************************************************************************
*****       G A M M A   S P E C T R U M   A N A L Y S I S       *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
*************************************************************************
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Report Generated On : 11/5/2002 9:41:14 AM

RIN Number : 02S0220
Analytical Batch ID : 0208234732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

B-428

B428-A-001

Media Sample location

4, 15

Sample Number : 02S0220-017.001
Lab Sample Number : CMLS-1640
Sample Receipt Date : 8/23/2002
Sample Volume Received : 1.38E+002 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.380E+002 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/21/2002 9:37:00 AM
Acquisition Started : 8/27/2002 8:01:02 AM

Count Time : 86400.0 seconds
Real Time : 86468.0 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/1/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/27/02
Efficiency Geometry ID : 02S0220-017.001

Analyzed By: Sheri Chambers Date: 11/5/02

Reviewed By: Marilyn Umbaugh Date: 11/5/02

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****

***** Sample and QC Sample Results Summary *****

****

Site Sample ID : 02S0220-017.001

Analytical Batch ID : 0208234732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1640

Geometry ID : 02S0220-017.001

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40	0.00E+000	0.00E+000	1.01E+000
CS-137	1.08E-002	7.98E-003	2.10E-002
TL-208	1.95E-001	2.67E-002	4.17E-002
PO-210	4.10E+003	1.11E+003	2.64E+003
BI-212	5.40E-001	1.44E-001	3.64E-001
PB-212	4.92E-001	2.21E-002	2.86E-002
BI-214	2.60E-001	4.79E-002	7.90E-002
PB-214	2.50E-001	2.46E-002	6.32E-002
RA-226	7.84E-001	8.02E-001	4.69E-001
AC-228	5.15E-001	7.41E-002	1.44E-001
TH-230	0.00E+000	0.00E+000	2.44E+000
Th-231	2.80E-001	4.72E-002	1.18E-001
PA-234	0.00E+000	0.00E+000	3.65E-002
PA-234M	4.30E+000	2.81E+000	4.44E+000
U-234	8.25E+000	3.74E+000	6.13E+000
U-235	1.13E-001	4.59E-002	2.90E-002
U238	1.51E+000	1.14E-001	1.49E-001
AM-241	1.90E-002	1.36E-002	2.27E-002

CANBERRA

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**********************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S      *****
**  C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
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Report Generated On : 11/5/2002 9:43:30 AM

RIN Number : 02S0220
Analytical Batch ID : 0208234732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

B428
B428-A-001
Media Sample Locations
7, 10, 12

Sample Number : 02S0220-018.001
Lab Sample Number : CMLS-1641
Sample Receipt Date : 8/23/2002
Sample Volume Received : 1.42E+002 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.420E+002 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/21/2002 9:31:00 AM
Acquisition Started : 8/28/2002 8:56:11 AM

Count Time : 86400.0 seconds
Real Time : 86467.1 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/1/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/27/02
Efficiency Geometry ID : 02S0220-018.001

Analyzed By: Sheri Chambers Date: 11/5/02

Reviewed By: Marilyn Umbaugh Date: 11/5/02

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****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0220-018.001

Analytical Batch ID : 0208234732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1641

Geometry ID : 02S0220-018.001

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	1.14E+001	4.86E-001	4.83E-001
CS-137	0.00E+000	0.00E+000	4.14E-002
TL-208	1.74E-001	2.33E-002	3.51E-002
PO-210	4.89E+003	2.06E+003	3.35E+003
BI-212	5.93E-001	6.00E-001	1.01E+000
PB-212	4.13E-001	2.03E-002	2.73E-002
BI-214	2.64E-001	3.73E-002	5.88E-002
PB-214	2.20E-001	2.45E-002	5.59E-002
RA-226	9.67E-001	8.66E-001	7.03E-001
AC-228	4.36E-001	6.71E-002	1.36E-001
TH-230	3.69E+000	1.21E+000	1.96E+000
Th-231	2.77E-001	4.64E-002	1.16E-001
PA-234	0.00E+000	0.00E+000	3.50E-002
PA-234M	3.16E+000	2.28E+000	3.77E+000
U-234	7.02E+000	3.94E+000	6.51E+000
U-235	1.01E-001	4.64E-002	4.35E-002
U238	1.62E+000	1.59E-001	1.46E-001
AM-241	0.00E+000	0.00E+000	2.52E-002

CANBERRA

Analysis Results Header 11/5/2002 9:53:17 AM Page 1

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*************************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S      *****
**  C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
*************************************************************************
```

Report Generated On : 11/5/2002 9:53:17 AM

RIN Number : 02S0220
Analytical Batch ID : 0209034732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Sample Number : 02S0220-019.001
Lab Sample Number : CMLS-1642
Sample Receipt Date : 8/23/2002
Sample Volume Received : 1.38E+002 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.380E+002 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/21/2002 9:21:00 AM
Acquisition Started : 9/3/2002 11:04:35 AM

Count Time : 86400.0 seconds
Real Time : 86469.2 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/1/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/27/02
Efficiency Geometry ID : 02S0220-019.001

Analyzed By: Sheri Chambers Date: 11/5/02

Reviewed By: Marilyn Umbaugh Date: 11/5/02

B428

B428-A-001

Media Sample Locations

1, 11, 14

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0220-019.001

Analytical Batch ID : 0209034732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1642

Geometry ID : 02S0220-019.001

Filename: S:\GENIE2K\GAMFILES\LI012\MODIFIED\RC10B019\G1900

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40	1.24E+001	5.22E-001	5.31E-001
CS-137	0.00E+000	0.00E+000	4.23E-002
TL-208	2.01E-001	2.68E-002	4.08E-002
PO-210	0.00E+000	0.00E+000	4.01E+003
BI-212	4.80E-001	3.10E-001	5.12E-001
PB-212	5.04E-001	2.30E-002	2.91E-002
BI-214	2.77E-001	4.96E-002	8.09E-002
PB-214	2.45E-001	2.65E-002	6.76E-002
RA-226	1.06E+000	5.99E-001	6.14E-001
AC-228	5.12E-001	7.34E-002	1.41E-001
TH-230	1.79E+000	6.34E-001	1.92E+000
Th-231	2.17E-001	5.44E-002	1.24E-001
PA-234	0.00E+000	0.00E+000	3.76E-002
PA-234M	2.43E+000	2.21E+000	3.68E+000
U-234	1.20E+001	4.23E+000	6.87E+000
U-235	9.93E-002	2.86E-002	3.80E-002
U238	1.39E+000	1.09E-001	1.46E-001
AM-241	1.49E-002	1.39E-002	2.33E-002

CANBERRA

Analysis Results Header 11/5/2002 9:55:29 AM Page 1

```
**********************************************************************
*****       G A M M A   S P E C T R U M   A N A L Y S I S       *****
**  C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
```

Report Generated On : 11/5/2002 9:55:29 AM

RIN Number : 02S0220
Analytical Batch ID : 0209054732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Sample Number : 02S0220-020.001
Lab Sample Number : CMLS-1643
Sample Receipt Date : 8/23/2002
Sample Volume Received : 1.29E+002 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.290E+002 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/21/2002 9:41:00 AM
Acquisition Started : 9/5/2002 12:54:45 PM

Count Time : 86400.0 seconds
Real Time : 86468.1 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/1/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/27/02
Efficiency Geometry ID : 02S0220-020.001

Analyzed By: Sheri Chambers Date: 11/5/02

Reviewed By: Marilyn Umbaugh Date: 11/5/02

B428
B428-A-001
Media Sample Locations
3, 8

CANBERRA

Sample and QC Sample Results Summary 11/5/02 9:55:30 AM Page 23

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0220-020.001

Analytical Batch ID : 0209054732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1643

Geometry ID : 02S0220-020.001

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40	1.06E+001	5.08E-001	5.53E-001
CS-137	0.00E+000	0.00E+000	4.37E-002
TL-208	1.36E-001	1.88E-002	2.75E-002
PO-210	1.75E+003	1.66E+003	2.76E+003
BI-212	5.74E-001	2.49E-001	4.03E-001
PB-212	3.20E-001	1.88E-002	2.92E-002
BI-214	2.20E-001	5.28E-002	9.35E-002
PB-214	1.39E-001	2.39E-002	6.22E-002
RA-226	8.91E-001	5.72E-001	4.95E-001
AC-228	2.63E-001	5.79E-002	1.50E-001
TH-230	0.00E+000	0.00E+000	2.52E+000
Th-231	2.69E-001	3.89E-002	1.23E-001
PA-234	0.00E+000	0.00E+000	3.79E-002
PA-234M	0.00E+000	0.00E+000	5.05E+000
U-234	6.04E+000	2.02E+000	5.96E+000
U-235	1.09E-001	2.93E-002	3.06E-002
U238	2.79E+000	1.90E-001	1.56E-001
AM-241	2.61E-002	1.37E-002	2.25E-002

CANBERRA

Analysis Results Header 11/5/2002 9:59:03 AM Page 1

```
**********************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S      *****
**  C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
```

Report Generated On : 11/5/2002 9:59:03 AM

RIN Number : 02S0220
Analytical Batch ID : 0209064732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Sample Number : 02S0220-021.001
Lab Sample Number : CMLS-1644
Sample Receipt Date : 8/23/2002
Sample Volume Received : 1.44E+002 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.440E+002 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/21/2002 9:33:00 AM
Acquisition Started : 9/6/2002 2:12:09 PM

Count Time : 86400.0 seconds
Real Time : 86468.1 seconds
Dead Time : 0.08 %

B428
B428-A-001
Media Sample Locations
5, 6

Energy Calibration Used Done On : 7/1/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/27/02
Efficiency Geometry ID : 02S0220-021.001

Analyzed By: Sheri Chambers Date: 11/5/02

Reviewed By: Marilyn Umbaugh Date: 11/5/02

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0220-021.001

Analytical Batch ID : 0209064732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1644

Geometry ID : 02S0220-021.001

Filename: S:\GENIE2K\CAMFILES\LI012\MODIFIED\RC10B019\G1900

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40	8.74E+000	4.47E-001	4.95E-001
CS-137	0.00E+000	0.00E+000	3.89E-002
TL-208	1.09E-001	2.00E-002	3.08E-002
PO-210	4.48E+003	2.11E+003	3.45E+003
BI-212	4.17E-001	2.47E-001	4.06E-001
PB-212	2.22E-001	2.43E-002	3.60E-002
BI-214	1.97E-001	3.79E-002	6.46E-002
PB-214	1.49E-001	2.09E-002	4.75E-002
RA-226	1.09E+000	9.25E-001	4.20E-001
AC-228	3.00E-001	7.03E-002	1.33E-001
TH-230	0.00E+000	0.00E+000	2.29E+000
Th-231	2.00E-001	5.82E-002	1.08E-001
PA-234	0.00E+000	0.00E+000	3.39E-002
PA-234M	3.41E+000	2.16E+000	3.52E+000
U-234	7.40E+000	3.72E+000	6.12E+000
U-235	6.30E-002	5.50E-002	2.60E-002
U238	1.02E+000	1.32E-001	1.38E-001
AM-241	0.00E+000	0.00E+000	2.38E-002

SURVEY UNIT G13-B-003
RADIOLOGICAL DATA SUMMARY

Survey Unit Description: Exterior of B428

37

G13-B-003
Radiological
Data Summary

Total Surface Activity Measurements

	15 Number Required	15 Number Obtained	
MIN	1.3		dpm/100 cm^2
MAX	80.5		dpm/100 cm^2
MEAN	41.3		dpm/100 cm^2
STD DEV	19.7		dpm/100 cm^2
TRANSURANIC DCGL$_w$	100		dpm/100 cm^2

Removable Activity Measurements

	15 Number Required	15 Number Obtained	
MIN	-0.9		dpm/100 cm^2
MAX	6.1		dpm/100 cm^2
MEAN	1.5		dpm/100 cm^2
STD DEV	2.4		dpm/100 cm^2
TRANSURANIC DCGL$_w$	20		dpm/100 cm^2

SURVEY UNIT G13-B-003
TSA DATA SUMMARY

Manufacturer:	NE Electra	NE Electra
Model:	DP-6	DP-6
Instrument ID#:	7	8
Serial #:	1379	396
Cal Due Date:	5/6/02	6/10/02
Analysis Date:	2/13/02	2/13/02
Alpha Eff. (c/d):	0.202	0.229
Alpha Bkgd (cpm)	7.0	2.0
Sample Time (min)	1.5	1.5
LAB Time (min)	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)
1	7	13.3	65.8	4.7	23.3	24.0
2	7	12.7	62.9	8.0	39.6	21.1
3	7	24.7	122.3	9.3	46.0	80.5
4	7	8.7	43.1	6.7	33.2	1.3
5	7	22.7	112.4	7.3	36.1	70.6
6	7	17.3	85.6	12.7	62.9	43.8
7	7	14.7	72.8	11.3	55.9	31.0
8	8	21.3	93.0	9.3	40.6	51.2
9	7	14.7	72.8	6.7	33.2	31.0
10	8	16.7	72.9	8.0	34.9	31.1
11	7	16.7	82.7	8.0	39.6	40.9
12	7	19.3	95.5	11.3	55.9	53.7
13	7	19.3	95.5	11.3	55.9	53.7
14	8	19.3	84.3	6.7	29.3	42.5
15	8	19.3	84.3	9.3	40.6	42.5
					41.8	Sample LAB Average
					MIN	1.3
					MAX	80.5
					MEAN	41.3
					SD	19.7
					Transuranic DCGL$_w$	100

1 - Average LAB used to subtract from Gross Sample Activity

QC Measurements

3QC	8	18.7	81.7	5.3	23.1	59.8
10C	8	12.0	52.4	4.7	20.5	30.6
					21.8	QC LAB Average
					QC MIN	30.6
					QC MAX	59.8
					QC MEAN	45.2
					QC SD	20.7
					Transuranic DCGL$_w$	100

1 - Average QC LAB used to subtract from Gross Sample Activity

SURVEY UNIT G13-B-003
SMEAR DATA SUMMARY

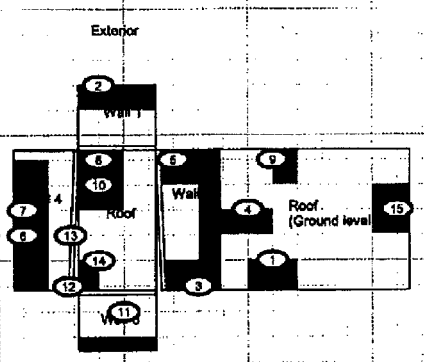
Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	1	2	3	4
Serial #:	767	1164	830	959
Cal Due Date:	4/30/02	5/13/02	2/16/02	7/14/02
Analysis Date:	2/13/02	2/13/02	2/13/02	2/13/02
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.1	0.1	0.0	0.3
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	7.0	7.0	4.5	8.8

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	2	1.0	2.7
2	1	1.0	2.7
3	1	0.0	-0.3
4	2	0.0	-0.3
5	3	1.0	3.0
6	1	1.0	2.7
7	4	0.0	-0.9
8	2	1.0	2.7
9	4	0.0	-0.9
10	3	0.0	0.0
11	4	0.0	-0.9
12	1	0.0	-0.3
13	2	2.0	5.8
14	3	2.0	6.1
15	3	0.0	0.0
		MIN	-0.9
		MAX	6.1
		MEAN	1.5
		SD	2.4
		Transuranic $DCGL_W$	20

40

PRE-DEMOLITION SURVEY FOR GROUP 13

Survey Area: B **Survey Unit:** G13-B-003 **Classification:** 3
Building: 428
Survey Unit Description: Exterior
Total Area: 103 sq. m. **Total Floor Area:** 60 sq. m.



Scan Area

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 30
0 METERS 10
1 inch = 24 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7787 Prepared for:
DynCorp
THE ART OF TECHNOLOGY

Scan Survey Information
Survey Instrument ID #(s): 7, 8
RCT ID #(s): 1, 2

MAP ID: 02-0155/B428-EX-SC March 22, 2002

G13-B-003

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ATTACHMENT C

Chemical Data Summaries and Sample Maps

Asbestos Data Summary

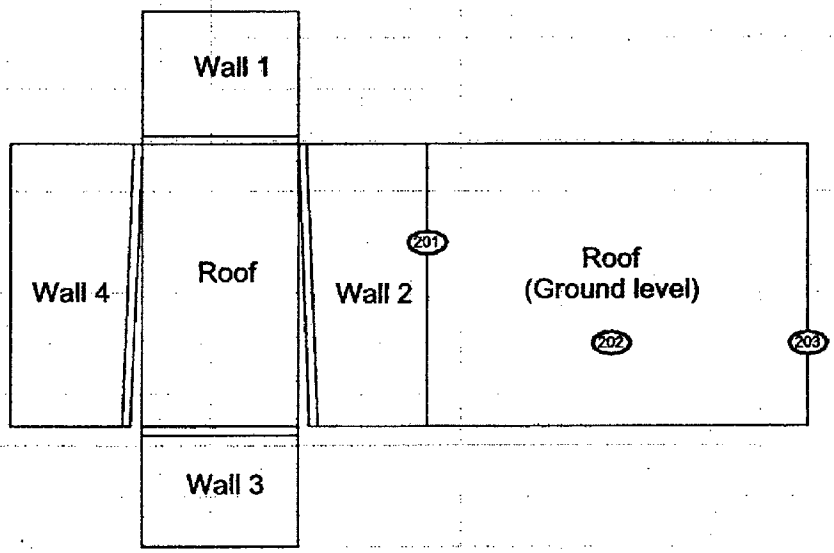
Sample Number	Map/Survey Point Location	Room	Sample Location	Analytical Results
Building 428				
428-01062003-315-201	201	Roof	Black fibrous roofing tar with silver paint	35 % Chrysotile
428-01062003-315-202	202	Roof	Black fibrous roofing tar	15 % Chrysotile
428-01062003-315-203	203	Roof	Black roofing tar with black and gray fibrous material	60 % Chrysotile

CHEMICAL SAMPLE MAP FOR B428

Building: 428 Exterior

Building 428

Exterior



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 15

0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for:

[redacted]

MAP ID: 02-0155/428-EX-ASB

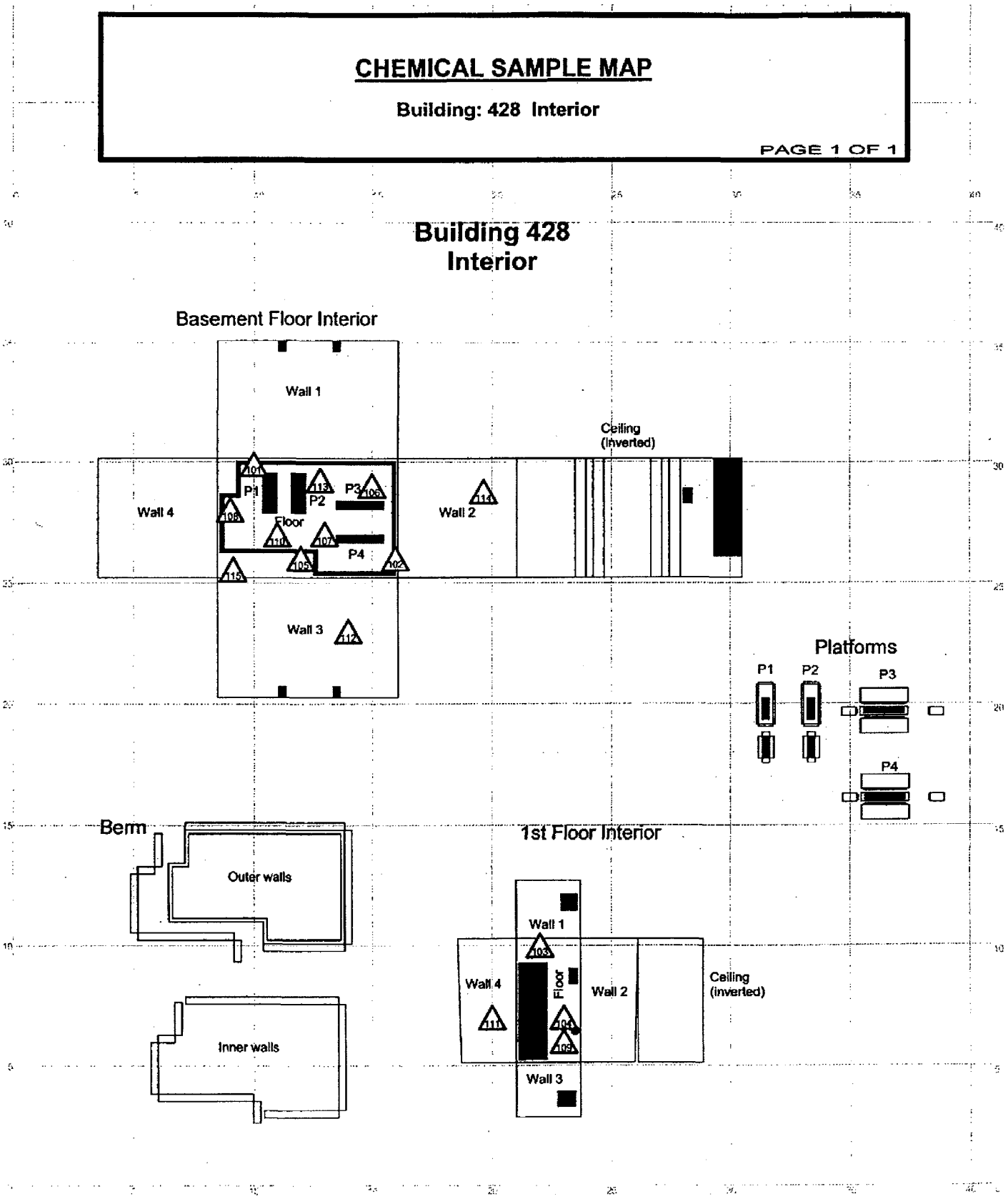
January 13, 2003

Beryllium Data Summary

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($\mu g/100 cm^2$)
428-11272002-315-101	101	Basement	On concrete floor	< 0.1
428-11272002-315-102	102	Basement	On edge of concrete berm	< 0.1
428-11272002-315-103	103	First floor	On concrete floor by entrance	< 0.1
428-11272002-315-104	104	First floor	On metal landing by east wall	< 0.1
428-11272002-315-105	105	Basement	On concrete floor at bottom of steps	< 0.1
428-11272002-315-106	106	Basement	On concrete floor	< 0.1
428-11272002-315-107	107	Basement	On concrete floor	< 0.1
428-11272002-315-108	108	Basement	On concrete floor	< 0.1
428-11272002-315-109	109	First floor	On metal landing by SE corner	< 0.1
428-11272002-315-110	110	Basement	On concrete floor	< 0.1
428-11272002-315-111	111	First floor	On ledge by west wall	< 0.1
428-11272002-315-112	112	Basement	On metal brace	< 0.1
428-11272002-315-113	113	Basement	On concrete tank brace	< 0.1
428-11272002-315-114	114	Basement	On metal flange	< 0.1
428-11272002-315-115	115	Basement	On concrete floor, SW corner	< 0.1

CHEMICAL SAMPLE MAP

Building: 428 Interior



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 25

0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER HILL

MAP ID: 02-0155/428BE-10

Dec 13, 2002

40

RCRA/CERCLA Constituents Data Summary

Sample Location / Media/Sample Number	Analysis	Result (mg/L)
Bldg 428, Concrete Slab, Locations 02S0221-001-005	RCRA Metals, SVOC, and VOC	RCRA Toxicity Characteristic substances less than regulatory limits, RCRA Listed substances not applicable.

RCRA Toxicity Characteristic Limits

Analyte	Regulatory limit (mg/L)
Arsenic (D004)	5.0
Barium (D005)	100.0
Benzene (D018)	0.5
Cadmium (D006)	1.0
Carbon tetrachloride (D019)	0.5
Chlordane (D020)	0.03
Chlorobenzene (D021)	100.0
Chloroform (D022)	6.0
Chromium (D007)	5.0
o-Cresol (D023)	200.0 (a)
m-Cresol (D024)	200.0 (a)
p-Cresol (D025)	200.0 (a)
Cresol (D026)	200.0 (a)
2,4 –D (D016)	10.0
1,4 Dichlorobenzene (D027)	7.5
1,2 Dichloroethane (D028)	0.5
1,1 Dichlorethylene (D029)	0.7
2,4 Dinitrotoluene (D030)	0.13 (b)
Endrin (D012)	0.02
Heptachlor – and its epoxide (D031)	0.008
Hexachlorobenzene (D032)	0.13 (b)
Hexachlorobutadiene (D033)	0.5
Hexachloroethane (D034)	3.0
Lead (D008)	5.0
Lindane (D013)	0.4
Mercury (D009)	0.2
Methoxychlor (D014)	10.0
MEK (D035)	200.0
Nitrobenzene (D036)	2.0
Pentachlorophenol (D037)	100.0
Pyridine (DD038)	5.0 (b)
Selenium (D010)	1.0
Silver (D011)	5.0
Tetrachloroethylene (D039)	0.7
Toxaphene (D015)	0.5
Trichloroethylene (D040)	0.5
2,4,5-Trichlorophenol (D041)	400.0
2,4,6-Trichlorophenol (D042)	2.0
2,4,5-TP (Silvex) (D017)	1.0
Vinyl Chloride (D043)	0.2

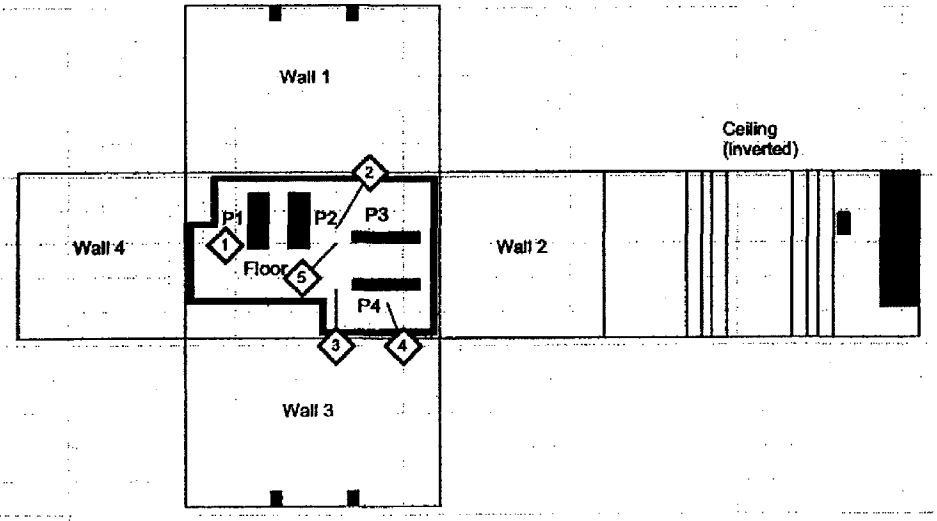
(a) Quantitation Limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.
(b) If o-, m-, and p-Cresol concentrations cannot be differentiated, the total Cresol (D026) concentration (200mg/l) is used.

CHEMICAL SAMPLE MAP FOR GROUP 13

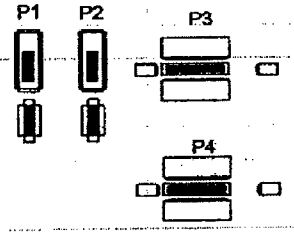
Building: 428 Interior

Building 428 Interior

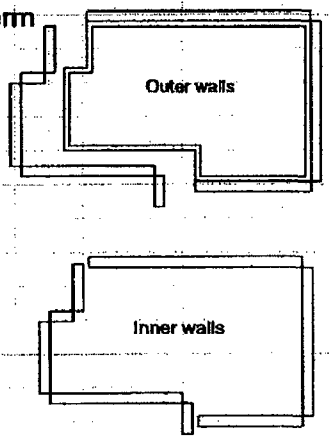
Basement Floor Interior



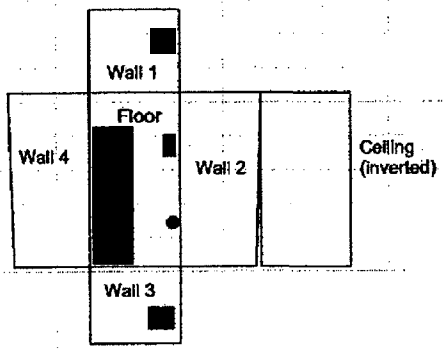
Platforms



Berm



1st Floor Interior



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 25

0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

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THE ART OF TECHNOLOGY

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ATTACHMENT D

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION (V&V) OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses [specifically asbestos, beryllium, metals, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs)].

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed. The radiological survey assessment is provided in Table D-1, asbestos in Table D-2, beryllium in Table D-3, metals in Table D-4, VOCs in Table D-5 and SVOCs in Table D-6. A data completeness summary for all results is given in Table D-7.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project File. The report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for Building 428 based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. Coupon and/or media samples were taken and analyzed by ISOCS Canberra gamma spectroscopy. Transuranic isotope activity and Uranium and/or other naturally occurring isotope activity were evaluated against, and were less than the Transuranic $DCGL_w$ (100 dpm/100cm^2) and the Uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits. Media results were converted to dpm/100cm^2 using the Media Conversion Table, evaluated against the transuranic DCGL limits, and are the values reported in the Radiological TSA Data Summary in support of the unrestricted release decision process.

Consistent with EPA's G-4 DQO process, the radiological survey design for each survey unit performed per PDS requirements was optimized by checking actual measurement results acquired during pre-demolition surveys against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

DQA SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on the qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled per PDS requirements yielded results less than their associated action levels and with acceptable certainties, except for the following contaminant:

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- Asbestos Containing Materials (ACM) identified at three locations greater than 1% by volume in the range of 15% to 60% Chrysotile. The ACM will be abated and final clearance sampling performed to verify compliance with unrestricted release limits prior to demolition.

Based upon an independent review of the radiological data, it is determined that the PDSP DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable DCGL unrestricted release levels confirming Type 1 facility classification. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable Radiological Safety Practice procedures, survey units were properly designed and bounded, and instrument performance and calibration was verified as acceptable. All results meet the PDSP unrestricted release criteria.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable), and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facility. On this basis, Building 428 meets the unrestricted release criteria with the confidences stated herein.

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Table D-1 V&V of Radiological Results – Building 428

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	Measure	Frequency	COMMENTS
ACCURACY	Initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	Daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	Local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	Field duplicate measurements for TSA	≥5% of real survey points	≥10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Units B428-A-001 and G13-B-003.	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	*NA*	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys Usable results vs. unusable	>95% >95%	NA	See Table D-7 for details.
SENSITIVITY	Detection limits	TSA: ≤50 dpm/100cm^2 RA: ≤10 dpm/100cm^2	all measures	PDS MDAs ≤ 50% $DCGL_w$

Table E-2 V&V of Asbestos Results - Building 428

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
ASBESTOS	METHOD: EPA 600/R-93/116	LAB ---->	Reservoirs Environmental, Inc	
QUALITY REQUIREMENT		RIN ---->	RIN03Z0688	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial/continuing	below detectable amounts	≥1	Semi-quantitative, per (microscopic) visual estimation.
PRECISION	Actual Number Sampled LCSD Lab duplicates	all below detectable amounts	≥ 3 samples	Semi-quantitative, per (microscopic) visual estimation.
REPRESENTATIVENESS	COC	Qualitative	NA	Chain-of-Custody intact: completed paperwork, containers w/ custody seals.
	Hold times/preservation	Qualitative	NA	N/A
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	See original Chemical Characterization Package (planning document); for field/sampling procedures (located in project file;) thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Measurement Units	% by bulk volume	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	Qualitative	NA	See Table D-7, final number of samples at Certified Inspector's discretion.
SENSITIVITY	Detection limits	<1% by volume	all measures	N/A

Table D-3 V&V of Beryllium Results – Building 428

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville, Littleton, Co.	
		RIN ---->	RIN03Z0456	
QUALITY REQUIREMENTS		Measure	Frequency	COMMENTS
ACCURACY	Calibrations Initial	linear calibration	≥1	No qualifications significant enough to change project decisions, i.e. classification of a Type 1 Facility confirmed; all results were below associated action levels.
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks – lab & field	<MDL	≥1	
	Interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	Field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	Detection limits	MDL of 0.012 ug/100cm^2	all measures	

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Table E-4 V&V of Metal Results - Building 428

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
Metals (total)	METHOD: SW6010/6020	LAB ---->	Severn-Trent, Denver, Co.	
		RIN ---->	RIN02S0221	
QUALITY REQUIREMENTS		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial	linear calibration	≥1/batch	No qualifications significant enough to change project decision, i.e., classification of Type 1 areas confirmed; TCLP results well below associated action levels and regulatory limits.
	Continuing	80%<%R<120%	≥1/batch	
	LCS	80%<%R<120%	≥1/batch	
	MS	75%<%R<125%	≥1/batch	
	Blanks - lab	mg/kg	≥1/batch	
	Serial dilutions	%D<10%	≥1/batch	
	Interference check std (ICP)	80%<%R<120%	bracket batch	
PRECISION	MSD	RPD<30%	≥1/batch	
	Field duplicate	all results < RL	≥1/batch	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	≤180 days	NA	
	Controlling Documents (Plans, Procedures, Maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	mg/kg	NA	
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	Detection limits	Various	all analytes	

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Table E-5 V&V of VOC Results - Building 428

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
VOCs	METHOD: SW8260	LAB ---->	Severn-Trent, Denver, Co.	
		RIN ---->	RIN02S0221	
QUALITY REQUIREMENTS		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial	± 40%D in Response Factor	≥1/batch	No qualifications significant enough to change project decision, i.e., classification of Type 1 areas confirmed; all results were below regulatory limits.
	Continuing	80%<%R<120%	≥1/batch	
	LCS	80%<%R<120%	≥1/batch	
	MS	75%<%R<125%	≥1 batch	
	Blanks - lab	ug/kg	≥1/batch	
	Internal standards	retention times and area factors	≥1/batch	
	Surrogate	%R (variable)	≥1/batch	
PRECISION	MSD	RPD<30%	≥1/batch	
	Field duplicate	all results < RL	≥1/batch	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	≤ 14 days	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	ug/kg	NA	
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	Detection limits	Various	all analytes	

5h

Table E-6 V&V of SVOC Results - Building 428

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
SVOCs	METHOD: SW8270	LAB ---->	Severn-Trent, Denver, Co.	
		RIN ---->	RIN02S0221	
QUALITY REQUIREMENTS		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial	± 40%D in Response Factor	≥1/batch	No qualifications significant enough to change project decision, i.e., classification of Type 1 areas confirmed, all results were below regulatory limits.
	Continuing	80%<%R<120%	≥1/batch	
	LCS	80%<%R<120%	≥1/batch	
	MS	75%<%R<125%	≥1 batch	
	Blanks - Lab	ug/kg	≥1/batch	
	Internal standards	retention times and area factors	≥1/batch	
	Surrogate	%R (variable)	≥1/batch	
PRECISION	MSD	RPD<30%	≥1/batch	
	Field duplicate	all results < RL	≥1/batch	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	≤ 14 days	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	ug/kg	NA	
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	Detection limits	Various	all analytes	

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Table D-7 Data Completeness Summary For Building 428

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Asbestos	B428 (exterior)	6 biased (exterior)	3 biased (exterior)	ACM present, all results > 1% by volume (three locations)	40 CFR 763.86; CCR 1001-10; EPA 600/R-93/116 RIN03Z0688 – three locations identified as ACM > 1% by volume, range of 15% to 60% Chrysotile. ACM will be abated and clearance sampling performed to verify compliance with unrestricted release limits prior to D & D activities.
Beryllium	B428 (interior)	15 samples (10 random/5 biased - interior)	15 samples (10 random/5 biased - interior)	No Be contamination found at any location	10CFR850; OSHA ID-125G – RIN03Z0456 No results above the action level (0.2 ug/100cm^2) or investigative level (0.1 ug/100cm^2.)
Metals	B428 (interior)	4 (solids) and 1 duplicate (biased)	4 (solids) and 1 duplicate (biased)	No Metal contamination found, all results less than the regulatory limit	SW 846 1311; SW 846 6010/6010B RIN02S0221
VOCs	B428 (interior)	4 (solids) and 1 duplicate (biased)	4 (solids) and 1 duplicate (biased)	No VOC contamination found, all results less than the regulatory limit	6 CCR 1007-3; SW 846 1311/Method 8260 RIN02S0221
SVOCs	B428 (interior)	4 (solids) and 1 duplicate (biased)	4 (solids) and 1 duplicate (biased)	No SVOC contamination found, all results less than the regulatory limit	6 CCR 1007-3; SW 846 1311/Method 8270/8270C RIN02S0221

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Table D-7 Data Completeness Summary For Building 428

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area A Survey Unit: B428-A-001 Bldg. 428 (interior)	15 ά TSA and 15 α Smears (systematic) 3 QC TSA 30 TSA and 30 Smears-biased (Pre & Post Media) 100% scan interior floors, platforms, berm and lower walls < 6 ft.; 25% scan of walls > 6 feet and ceiling	20 ά TSA and 20 α Smears (systematic) 3 QC TSA 30 TSA and 30 Smears-biased (Pre & Post Media) 15 Media Samples 100% scan interior floor and lower walls < 6 ft.; 25% scan of upper walls > 6 feet and ceiling	No contamination at any location; all results below unrestricted release levels	Transuranic and/or Uranium DCGLs as applicable.
Radiological	Survey Unit: G13-B-003 Bldg. 428 (exterior)	15 ά TSA and 15 ά Smears (random) 2 QC TSA 5% scan	15 ά TSA and 15 ά Smears (random) 2 QC TSA 5% scan	No contamination at any location; all values below unrestricted release levels	Transuranic and/or Uranium DCGLs as applicable.

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